

forest is described as bearing "flowers, red and white, which are larger than a sieve, and of extraordinary fragrance." Mr. Macgowan adds:—"Mr. Taylor, while searching for orchids, heard of these majestic trees and huge flowers, which he inferred, from what natives said, were epiphyte orchids. I am moved to make known this sylvan discovery in the hope that, pending the exploration of this *terra incognita* by our botanists, Dr. Henry or Mr. Ford, residents in Formosa, will take measures to provide those naturalists with specimens of flowers, seeds, leaves, and bark of the trees concerning which the Chinese have excited our curiosity."

IN a capital address on "tooth culture," delivered at the annual meeting of the Eastern Counties Branch of the British Dental Association, and printed in the current number of the *Lancet*, Sir James Crichton-Browne referred to a change which has taken place in bread, as one of the causes of the increase of dental caries. So far as our own country is concerned, this is essentially an age of white bread and fine flour, and it is an age therefore in which we are no longer partaking, to anything like the same amount that our ancestors did, of the bran or husky parts of wheat, and so are deprived to a large degree of a chemical element which they contain—namely, fluorine. The late Dr. George Wilson showed that fluorine is more widely distributed in nature than was before his time supposed, but still, as he pointed out, it is but sparingly present where it does occur, and the only channels by which it can apparently find its way into the animal economy are through the siliceous stems of grasses and the outer husks of grain, in which it exists in comparative abundance. Analysis has proved that the enamel of the teeth contains more fluorine, in the form of fluoride of calcium, than any other part of the body, and fluorine might, indeed, be regarded as the characteristic chemical constituent of this structure, the hardest of all animal tissue, and containing 95.5 per cent. of salts, against 72 per cent. in the dentine. As this is so, it is clear that a supply of fluorine, while the development of the teeth is proceeding, is essential to the proper formation of the enamel, and that any deficiency in this respect must result in thin and inferior enamel. Sir James Crichton-Browne thinks it well worthy of consideration whether the reintroduction into our diet of a supply of fluorine in some suitable natural form—and what form, he asks, can be more suitable than that in which it exists in the pellicles of our grain stuffs?—might not do something to fortify the teeth of the next generation.

THE recent publication is announced of the first number of a new monthly journal under the title *Rivista di patologia vegetale*. It is edited by Sigg. A. N. and A. Berlese, and published at Avellino, in Italy; and is to be devoted to the study of animal and vegetable parasites infesting cultivated plants, to the diseases which they cause, and the remedies employed to combat them.

DR. H. C. CHAPMAN contributes to the latest instalment of the Proceedings of the Academy of Natural Sciences, Philadelphia, a paper describing observations on the brain of the gorilla. He says that while the fissures and convolutions are disposed in the brain of the gorilla in the same manner, generally speaking, as in that of man or of the chimpanzee or orang, it is nevertheless a low type of brain, being much less convoluted than the brain of man or of either of the two other anthropoids. If it were permissible, in the absence of living links or sufficient fossil remains, to speculate upon the development of man and the anthropoids from lower forms of simian life, Dr. Chapman thinks it might be inferred from the character of the brain that the gorilla had descended from some extinct *Cynocephalus*; the chimpanzee and orang from extinct macaque and gibbon-like forms; and man from some generalized simian form combining in itself the characteristics of existing anthropoids.

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AT the annual meeting of the Department of Electricity of the Brooklyn Institute of Arts and Sciences on June 1, Prof. E. J. Houston delivered a lecture on recent advances in the applications of electricity. Turning for a moment from the past to the future, Prof. Houston said it was related of Faraday that when asked his opinion of the future of the electric motor, he put up his cane and stopped it. That was Faraday's opinion. Prof. Houston's view was more favourable. The true efficiency of a triple expansion steam engine, he said, did not exceed 17 per cent. as a maximum. With the electric motor we could already get an efficiency of from 90 to 95 per cent., but it was to-day dependent on the steam-engine. A cheaper method would be devised for generating currents, and he believed there were now those living who would see the steam-engine relegated to the scrap heap. Possibly the motor of the future would be operated by thermo-electricity. Possibly a means would be devised of converting the latent energy of coal directly into potential electrical energy. He believed in the successful solution of the problem of aerial navigation in the near future. He was confident that ere long our present methods of electric illumination, in which 97 to 98 per cent. of the energy was expended in useless heat rays, would be supplanted by one in which the order was reversed—in which 97 to 98 per cent. would be converted into light, and but 2 to 3 into heat. And finally, he believed the time was near at hand when electro-therapeutists, instead of regarding the human body as a vehicle for electricity, would regard it as a source of electricity. They would then make their diagnoses with the voltmeter, the ammeter, and the condenser, and the result would then be definite, instead of, as at present, "hit or miss."

THE *Mediterranean Naturalist* quotes a statement made by the late Rev. H. Seddall, who was many years a resident of Malta, as to a curious form of industry formerly practised by the Maltese. "Five species of *Pinna*," wrote Mr. Seddall, "are found in Malta, some of them common in the harbours within reach of a boat or a pole hook. They project from the mud amongst the *Zostera* roots, to which they are attached by their silken cable. Of this silk, which is of fine texture, but heavy, I have seen gloves made."

THE additions to the Zoological Society's Gardens during the past week include a Palm Squirrel (*Sciurus palmarum*) from India, presented by Miss Daisy Fox; a Common Roe (*Capreolus caprea* ♂), European, presented by Mr. E. J. H. Towers; a Tawny Owl (*Syrnium aluco*), European, presented by Mr. Leigh Robinson; a Bronze Fruit Pigeon (*Carpophaga anea*) from India, presented by Mr. J. L. Shand; a Tuberculated Tortoise (*Homopus femoralis*), a Tent Tortoise (*Testudo tentoria*), two Fisk's Tortoises (*Testudo fiski*), a Robben Island Snake (*Coronella phocaenum*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; two Green Lizards (*Lacerta viridis*), European, three Viperine Snakes (*Tropidonotus viperinus*) from North Africa, presented by the Rev. F. M. Haines; a Common Chamelon (*Chamaleon vulgaris*) from North Africa, presented by Mr. Samuel L. Bensusan; a Water Viper (*Cenchrus piscivora*) from North America, presented by Mr. Ernest Brewerton; a Zorilla (*Zorilla typica*), a Grey Monitor (*Varanus griseus*) from Egypt, a Stanley Parrakeet (*Platycercus icterotis*) from Australia, deposited; two Asiatic Wild Asses (*Equus onager* ♂ ♀) from South-west Asia, received in exchange; four Wapiti Deer (*Cervus canadensis* ♂ ♀ ♀ ♀) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE RED SPOT ON JUPITER.—M. J. J. Landerer, in *Bulletin Astronomique* (tome ix., June), gives the results of his measurements of the dimensions and Jovicentric latitude of the red spot on Jupiter. The method he adopted was to make use of the transit

of the satellite's shadows as they were projected on the extreme points of the two axes of the spot, the mean giving the position of the spot's centre. In the case of the third satellite, when its latitude was $-1^{\circ} 45' 14''$, that of its shadow—reckoning from the bottom side of the spot—was $-30^{\circ} 34' 36''$. The latitude of the shadow of the second satellite came out to be $-17^{\circ} 48' 10''$, and after allowing for the fact that it was projected tangentially on the side of the spot and for the diffraction of the instrument, this value for the latitude of the north side of the spot became $-20^{\circ} 56' 37''$. Taking the mean of the values obtained from both satellites, the latitude of the centre was $-25^{\circ} 45' 36''$, and, with the polar semi-diameter as unity, the magnitude of the spot was 0.20297.

The mean value of the latitude obtained from eleven observations by Denning, Green, Ricco, Williams, Keeler, and Terby was $21^{\circ} 5' \pm 2^{\circ} 05'$, the major and minor axes of the spot being 0.555 and 0.188 respectively. Using the micrometer, the latitude, according to Young, amounted to 40° ; while Denning estimated that the major axis embraced an arc varying between $29^{\circ} 3'$ and $37^{\circ} 8'$.

A MEAN TIME SUN-DIAL.—A very ingenious sun-dial, capable of indicating mean time, has been recently invented by Major-General Oliver, the construction of the instrument being undertaken by Messrs. Negretti and Zambra. In an ordinary sun-dial, the time is read off generally by the position of the centre of a shadow, cast by a straight-edged style, on a flat surface on which the hours are graduated. The peculiarity of the present instrument is that the time is indicated by the position of the edge of a shadow cast by a "nine-pin" shaped style, with regard to an equatorial circular line. The style is fixed along the diameter of a semicircular arc, which is clamped by means of a screw to a firm stand to suit any latitude; at right angles to this arc, and also capable of adjustment, is another semicircle, graduated in five-minute divisions. Owing to the change of declination of the sun throughout the year, different parts of the shadow of the style are brought on to the hour circle in such a way that the difference between the time indicated (by the dial) and mean time, or the equation of time, is counterbalanced by the change in position of the shadow, due to the peculiar form of the style. If we start, for instance, on December 24, the readings have to be taken from the shadow of the eastern edge of the lower part of the style in an upward direction, the bulging out of the style counteracting the increase and decrease of the equation of time (which is here positive) until June 14 is reached. Owing to the thickness of the style's axis, a slight adjustment is here necessary when we pass to the other side of the style; this adjustment is facilitated by placing the twelve o'clock graduation to the western of two marks shown on the vertical circle. This being done, the readings from the shadow, cast now by the western side of the upper protuberance, are taken until the other nodal point on June 14 is reached. At this time also—in fact, four times a year—this slight alteration has to be made. From this latter date until December 24 is reached the same process is repeated, only the respective opposite sides of the style are used in the inverse order. To obviate the necessity of having two styles, which, of course, would have to be the case if the greatest accuracy were desired, owing to the differences in the maximum values of the equation of time, one with a mean contour is given: the error produced by this is practically very slight, amounting in time to about one-sixteenth of greatest value of the equation of time—a quantity scarcely appreciable, on account of the lack of sharpness of the edge of the shadow.

COMET SWIFT (1892 MARCH 6).—*Edinburgh Circular* No. 28 contains a continuation of the ephemeris of Comet Swift (March 6, 1892) for the month of July and part of August, from which we make the following extract:—

		<i>Berlin Midnight.</i>					
1892.	R.A.	Decl.	log Δ.	log r.	Br		
	h. m. s.	° ' "					
July 7	0 52 36	+48 0.5					
8	53 33	12.6	0.2391	0.2552	0.17		
9	54 28	24.5					
10	55 20	36.2					
11	56 10	47.7					
12	56 58	59.0	0.2427	0.2665	0.16		
13	57 43	49 10.0					

The brightness at the time of discovery being taken as the unit of brightness, it will be seen that the comet is at present

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more than five times dimmer than it was in March. In fact, it is rapidly becoming invisible, and will only be able to be observed with large instruments for another two months or so. Its position on July 7 will lie to the very southern extremity of the constellation of Cassiopeia, forming nearly an equilateral triangle with ξ and π .

STARS' PROPER MOTIONS.—Mr. J. G. Porter contributes to the *Astronomical Journal*, No. 268, a catalogue of the proper motions of 301 stars, which amount to half a second or more in a year. This list, as he informs us, is from a still more extensive catalogue which he hopes soon to publish; and the proper motions contained in it are rendered more trustworthy by the enlightenment of new observations. The positions of the stars are all brought up to the epoch 1900.0.

GEOGRAPHICAL NOTES.

M. CHARLES ALLUAUD describes his researches on the Island of Mahé, the largest of the Seychelles Group (see *NATURE*, p. 162), in a letter to the Paris Geographical Society. He has studied the fauna with some care, and remarks on the singular poverty of animal life compared with the great luxuriance of vegetation. In Port Victoria, the chief settlement in Mahé, the only form of butcher-meat obtainable is the flesh of the great turtle (*Chelone nuda*) whose shell is valueless, the tortoise-shell fisheries of the island depending on the *Chelone imbricata*. M. Alluaud hopes to bring back with him living specimens of the elephantine turtles of the Aldabra Islands, specimens of which have been transported to the Seychelles.

THE expectation of an Antarctic expedition, on which valuable scientific observations might have been made, has proved illusory. Captain Gray, of Peterhead, had organized a whaling voyage to the far south, and appealed to the public for funds to carry it out with some prospect of commercial success, but the response was so unsatisfactory that the enterprise has been abandoned. From a scientific point of view, the advantages of Antarctic exploration are so great, and the probability of valuable practical results so apparent, that the apathy alike of the British and Australian Governments as well as of the general geographical public is incomprehensible. The fact that no steamer has ever been despatched to the south of the Antarctic Circle with the object of attaining high latitudes says much for the prudence and little for the energy of present-day explorers.

A CHAIR of Colonial Geography is about to be established at the Sorbonne for the special study of the French colonies.

THE discovery of America by Columbus is to be celebrated in Hamburg on October 11 and 12 by gatherings of delegates from the German Universities and Geographical Societies, by whom papers bearing on German enterprise in the sixteenth century will be read. An exhibition of articles illustrating the early connection of Hamburg and America will also be held.

THE Manchester Geographical Society has just published its *Journal* for July–September 1891, containing several interesting papers on India and a variety of short notices. It is unfortunate that the small local encouragement given to this Society makes the earlier publication of its memoirs impossible. Surely Manchester could afford and should endeavour to maintain a Geographical Society as prosperous financially as it is enterprising and persevering. The contrast between the many provincial Geographical Societies in Germany and France with the three already established in England corresponds to the relative interest in geography as an aid to commerce on the Continent and in Great Britain.

METALLIC CARBONYLS.¹

JUSTUS LIEBIG, perhaps the most prophetic mind among modern men of science, wrote in the year 1834 in the *Annalen der Pharmacie*. "I have previously announced that carbonic oxide may be considered as a radical, of which carbonic acid and oxalic acid are the oxides, and phosgene gas is the chloride. The further pursuit of this idea has led me to the most singular and the most remarkable results."

Liebig has not told us what these results were, and it has taken many years before the progress of chemical research has revealed to us what may at that early date have been before Liebig's vision. I will to-night bring before you some important

¹ Friday Evening Discourse delivered at the Royal Institution by Ludwig Mond, F.R.S., on June 3.